Arkwood is a Superfund site under the direct authority of EPA. The surface water regulations, APC&EC Regulation No. 2 would be an applicable or relevant and appropriate requirement (ARAR).

Water Quality Standards and the basis for calculating a specific standard are given in APC&EC Regulation 2. Definitions for all terms used are also in the Regulation. The method of calculation follows:

Because the State Water Quality Standard is pH based, surface water sample(s) proximal to the site are used to determine if the standard should be changed. A review of APC&EC Regulation 2 indicates that the equation for the calculation has not changed since the ROD was issued. In addition, pH data should be included in the weir discharge sample to ensure it falls between 6.0 and 9.0 pH.

The pH data from the nearest ADEQ Water quality monitoring station (WHI0071) for the period 2004-2009 was averaged for use in the calculation. Periodic updates may be made based on more recent or site specific data. This would be done with each five year review of the NPL site at a minimum.

Pentachlorophenol Calculations for Surface Discharge

Per Reg. 2.508, the Pentachlorophenol aquatic life water quality standards (WQS) are as follows:

Acute	Chronic
e[1.005(pH)-4.869]	e[1.005(pH)-5.134]

pH = 7.84 s.u.

The pH used in calculating the standards, 7.84 s.u., is the average pH taken at monitoring station WHI0071 from 2004 – 2009.

Acute Standard

e[1.005(7.84)-4.869] = 20.29 µg/l

Chronic Standard

e[1.005(7.84)-5.134] = 15.57 µg/l

Reasonable potential for water quality violations is determined by comparing the effluent data to the WQS without taking into account a background flow because the 7Q10 of the receiving stream is 0 cfs. In accordance with the procedures outlined in the Continuing Planning Process (CPP), the highest effluent test result is compared to the water quality standards because over twenty data points exist. The highest effluent test result is 20 µg/l which occurred on July 10, 2008. It is important to note that higher test results occurred on October 22, 2007, and July 7, 2008. Those test results, 53.7 µg/l and 189 µg/l, respectively, were not used because it appears as though those results were not representative of the effluent.

Comparison with Acute Standard

20 µg/l < 20.29 µg/l

Comparison with Chronic Standard

20 µg/l > 15.57 µg/l

Organisms in the effluent discharge stream experience chronic exposure, therefore; the chronic standard of 15.57 g/l is the appropriate standard for the Arkwood Site.

A Use Attainability Analysis (UAA) would be required to petition for a change in the allowable limit. This change would need to go through the APC&E commission and EPA Region 6.

As a potential drinking water source, the limit could be set at the Federal MCL which is 1 µg/l.

Excerpts from e-mail correspondence with Mr. Grisham compiled 4/6/2011 that may be useful:

Arkwood is a Superfund site under the direct authority of EPA. The surface water regulations, APC&EC Regulation No. 2 would be an applicable or relevant and appropriate requirement (ARAR).

b.. Is there any evidence that, at present or at any other time, Pentachlorophenol existed in New Cricket Spring in concentrations that violate the stipulation of Reg. 2.508 that "Toxic substances shall not be present in receiving waters, after mixing, in such quantities as to be toxic to human, animal, plant or aquatic life or to interfere with the normal propagation, growth and survival of the indigenous aquatic biota"?

Prior to the pilot testing, levels of PCP in the spring exceeded the prescribed clean up goal in the ROD. That is what prompted implementation of the pilot test program. The most recent analytical data indicate that the level of PCP at the spring was 66 ppb (ug/l) which exceeds the daily maximum of 18.7 ug/l. Treatment prior to releasing the water back into the receiving stream reduced the concentration to <0.2ppb.

c.. For the purpose of New Cricket Spring groundwater cleanup, how did ADEQ define the following terms contained within Reg. 2.508: "receiving waters, after mixing;" "indigenous aquatic biota;" "zone of initial dilution;" and "edge of the mixing zone."

Definitions for these terms can be found in APC&EC Regulation 2.106. The receiving waters would now be just after the weir where the water rejoins the original spring pathway.

d.. Is groundwater cleanup at New Cricket Spring considered a "non permit issue" by ADEQ for the purposes of Reg. 2.508?

Under CERCLA, as part of the paper reduction act, a CERCLA site must meet the intent of a permit, but an actual "permit" will not be required. In Regulation 2, because criteria have been established for PCP, it does not fall into the "non permit issue" category.

e.. If groundwater cleanup at New Cricket Spring is considered a "non permit issue" by ADEQ for the purposes of Reg. 2.508, did ADEQ "consider No Observed Effect Concentrations (NOECs) or other literature values as appropriate" as provided by this Regulation?

Again, APC&EC Regulation 2 would be an ARAR and must be considered. Criteria for PCP are set forth in Regulation 2. These criteria are based upon a volume of NOEC and literature data considered sufficient by EPA to determine appropriate criteria.

f.. Why does Mr. Arjmandi calculate standards for "monthly averages and daily maximums" when ADEQ Reg. 2.508 specifies "Acute Values (µg/l) (Never to Exceed)" and "Chronic Values (µg/l) (24-hr Average)" with no mention of "monthly averages"?

The 24-hour average corresponds to the monthly average and the daily Maximum to the Acute Value.

g.. How do the formulae mentioned above resolve to the decimal values Mr. Arjmandi certifies? I.e. could you please show me the how the calculations work?

It is not clear to what you are referring. Please note as previously, that your comment included a typographiocal error with respect to the units of measure. Mr. Arjmandi's letter to McKesson states the monthly average as 9.3 ug/l and the daily maximum as 18.7 ug/l with pH to be between 6.0 and 9.0.

h.. Did the analytical laboratories standardize testing methodologies to adjust the pH variable to Mr. Arjmandi's baseline of 7.38? If so, where does that variable appear in the reports?

The pH baseline is from the site investigation and the numerous samples collected during that time. The applicability of this value should be re-evaluated by EPA at least during the 5 year review period.

i.. Why has the treatment of water from New Cricket Spring, which is not a source of drinking water, been compelled when ADEQ Regulation 2 standards apply for aquatic life only and, as Ms. Cusher stated to me on July 28, 2010: "At this time, ADEQ has not adopted the Human Health Criteria in EPA's National Recommended Water Quality Criteria for Pentachlorophenol"

All waters of the state are considered as potential drinking water sources unless designated otherwise. At this time, Arkansas has NOT designated any waters as non-potable.